

Jinsong Chen

Lawrence Berkeley National Laboratory
MS 90-1116, 1 Cyclotron Road, Berkeley, CA 94720
Phone: (510) 486-6842, Fax: (510) 486-5686, E-mail: jchen@lbl.gov
<http://esd.lbl.gov/people/jinsong/index.htm>

EDUCATION

Ph.D. (Environmental Engineering) and M.A. (Statistics) University of California, Berkeley, CA, 2001

Thesis: *Bayesian Approach for Subsurface Characterization Using Hydrogeological and Geophysical Data*

M.S. (Environmental Fluid Mechanics) Georgia Institute of Technology, Atlanta, GA, 1997

M.Eng. (Hydrology and Water Resources) Tsinghua University, Beijing, China, 1990

B.Eng. (Water Resources Engineering) and B.S. (Applied Mathematics) Tsinghua University, Beijing, China, 1988

RESEARCH INTERESTS

My research interests are in an interdisciplinary field across hydrology, hydrogeology, geophysics, and statistics with emphasis on the development and application of effective statistical models for solving complex problems in earth and environment sciences. My current research areas include:

Hydrogeophysics

Estimation of hydraulic conductivity using borehole flowmeter test and crosshole ground-penetrating radar (GPR) tomographic data; Estimation of geochemical parameters using borehole geochemical and lithologic measurements and crosshole GPR tomographic data; Estimation of fracture zonation using borehole flowmeter test and crosshole seismic traveltimes data; Development of effective statistical models for integrating inverted geophysical data with varieties of borehole logs; Development of joint stochastic inversion approaches for combining direct hydrogeological and geophysical measurements.

Computational Geophysics

Stochastic inversion of seismic amplitude versus angle (AVA), crosswell seismic traveltimes, borehole full waveform seismic, 1D electromagnetic, and 3D gravity data; Joint stochastic inversion of seismic AVA and 1D controlled-source electromagnetic (CSEM) data; Joint stochastic inversion of seismic P- and S-wave traveltimes and crosshole EM tomographic data; Joint stochastic inversion of borehole full waveform seismic and 3D EM data; Estimation of reservoir parameters using stochastic rock physics models and Markov chain Monte Carlo (MCMC) methods.

Computational Biology

Microarray data analysis, hierarchical clustering, multiple regression, logistic regression, sampling-based multiple testing.

PROFESSIONAL EXPERIENCE

Geological Scientist, Lawrence Berkeley National Laboratory, Berkeley, CA, 4/2004—Present
Research Statistician, University of California, Berkeley, CA, 10/2005—8/2006
Research Engineer, University of California, Berkeley, CA, 2003—2005
Postdoctoral Fellow, Lawrence Berkeley National Laboratory, Berkeley, CA, 2003
Postdoctoral Fellow, University of California, Berkeley, CA, 2002
Research Scientist and Lecturer, Tsinghua University, Beijing, China, 1990-1995

PUBLICATIONS

Papers in Refereed Journals

- Chen, J., M. Hoversten, D. Vasco, Y. Rubin, and Z. Hou (in revision), A Bayesian model for gas saturation estimation using marine seismic AVA and CSEM data, *Geophysics*.
- Chen, J., S. Hubbard, J. Peterson, K. Williams, M. Fienen, P. Jardine, and D. Watson (2006), Development of a joint hydrogeophysical inversion approach and application to a contaminated fractured aquifer, *Water Resources Research*, 42(6).
- Hou, Z., Y. Rubin, M. Hoversten, D. Vasco, and J. Chen (in press), Reservoir parameter identification using minimum relative entropy based Bayesian inversion of seismic AVA and marine CSEM data, *Geophysics*.
- Rubin, Y., M. Hoversten, Z. Hou, and J. Chen (2006), Risk reduction in gas reservoir exploration using joint seismic-EM inversion, *Gas TIPS*.
- Kowalsky, M., J. Chen, and S. Hubbard (2006), Joint inversion of geophysical and hydrological data for improved subsurface characterization, *The leading Edge*, 25, 730.
- Hoversten, M., F. Cassassuce, E. Gasperikova, G. Newman, J. Chen, Y. Rubin, Z. Hou, and D. Vasco (2006), Direct reservoir parameter estimation using joint inversion of marine seismic AVA and CSEM data, *Geophysics*, 71, C1.
- Scheibe, T. D., Y. Fang, C. J. Murray, E. E. Roden, J. Chen, Y.-J. Chien, S. C. Brooks, and S. S. Hubbard (2006), Transport and biogeochemical reaction of metals in a physically and chemically heterogeneous aquifer, *Geosphere*, 2(4).
- Chen, J., S. Hubbard, Y. Rubin, C. Murray, E. Roden, and E. Majer (2004), Geochemical characterization using geophysical data and Markov chain Monte Carlo methods: a case study at the South Oyster Bacterial Transport Site in Virginia, *Water Resources Research*, 40(12).
- Chen, J., and Y. Rubin (2003), An effective Bayesian model for lithofacies estimation using geophysical data, *Water Resources Research*, 39(5).
- Chen, J., S. Hubbard, and Y. Rubin (2001), Estimating the hydraulic conductivity at the South Oyster Site from geophysical tomographic data using Bayesian techniques based on the normal linear regression model, *Water Resources Research*, 37(6).
- Hubbard, S., J. Chen, J. Peterson, E. Majer, K. Williams, D. Swift, B. Mailloux, and Y. Rubin (2001), Hydrogeological characterization of the South Oyster Bacterial Transport Site using geophysical data, *Water Resources Research*, 37(10).

DeFlaun, M., ..., J. Chen, and Others (2001), Breakthroughs in bacterial transport, *EOS Transactions*, Article, 82(38).

Ezzedine, S., Y. Rubin, and J. Chen (1999), Bayesian method for hydrogeological site characterization using borehole and geophysical survey data: theory and application to the Lawrence Livermore National Laboratory Superfund Site, *Water Resources Research*, 35(9).

Chen, J., and X. Lin (1994), Self-optimization of water resources systems simulation, *Journal of Tsinghua University (Science & Technology)*, 34(2).

Chen, J., and X. Lin (1993), Self-optimization problems in large-scale water resources systems, *Hydro-energy Technique and Economy*, 49(2).

Papers in Conference Proceedings and Books

Linde, N., J. Chen, M. Kowalsky, and S. Hubbard (2006), Hydrogeophysical parameter estimation approaches for field scale characterization, In *Applied Hydrogeophysics*, edited by H. Vereecken et al., Chapter 2, 9-44, Springer.

Chen, J., and M. Hoversten (2005), Estimating reservoir parameters from seismic and electromagnetic data using stochastic rock physics models and Markov chain Monte Carlo methods, *SEG Expanding Abstracts*, 24, 1437.

Hoversten, M., J. Chen, E. Gasperikova, and G. Newman (2005), Integration of marine CSEM and seismic AVA data for reservoir parameter estimation, *SEG Expanding Abstracts*, 24, 579.

Hou, Z., Y. Rubin, M. Hoversten, J. Chen, and D. Vasco (2005), MRE-based Bayesian inversion of seismic and EM data for identification of reservoir parameters, *SEG Expanding Abstracts*, 24, 635.

Chen, J., M. Hoversten, D. Vasco, Y. Rubin, and Z. Hou (2004), Joint stochastic inversion of seismic AVO and EM data for gas saturation estimation using a sampling-based stochastic model, *SEG Expanding Abstracts*, 23, 236.

Chen, J., S. Hubbard, and J. Peterson (2004), A comparison between hydrogeological characterization approaches applied to granular porous and fractured media, *The Proceedings of International Symposium on the Dynamics of Fluids in Fractured Rock*, Berkeley, California, February 10-12.

Chen, J., and M. Hoversten (2003), Joint stochastic inversion of geophysical data for reservoir parameter estimation, *SEG Expanded Abstracts*, 22, 726.

Chen, J., and Y. Rubin (2002), Characterizing lithofacies from borehole and crosswell geophysical data using Bayesian methods coupled with fuzzy neural networks, *The Proceedings of International Groundwater Symposium*, Berkeley, California, March 25-28.

Chen, J., and X. Lin (1992), Sensitivity analysis of weight vectors in multiple criteria decisions, *7th SESC (System Engineering Society of China) Annual Conference Papers*.

Chen, J., and X. Lin (1990), Multi-objective decision theories and methods in large-scale hydraulic engineering, *Collection of System Engineering Papers on Hydraulic Engineering*.

Abstracts

- Hubbard, S., K. Williams, A. Kemna, J. Chen, and J. Peterson (2006), Use of geophysical methods to investigate, guide, and access contaminant remediation approaches, *GSA Abstracts*, 38(7), Philadelphia, PA, October 22-25.
- Hubbard, S., J. Chen, Y. Fang, K. Williams, S. Mukhopadhyay, E. Sonnenthal, K. McFarlane, N. Linde and T. Scheibe (2006), Improved parameterization of hydrological models and reduction of geophysical monitoring data ambiguity through joint use of geophysical and numerical modeling methods, *CWMR*, Copenhagen, June 19-23.
- Chen, J., M. Hoversten, D. Vasco, Z. Hou, and Y. Rubin (2005), Markov chain Monte Carlo based approaches for inverse problems, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H21G-07.
- Hubbard, S., J. Peterson, J. Chen, K. Williams, M. Conrad, B. Fabishenko, P. Long, A. Willett, and T. Hazen (2005), Geophysical monitoring of Cr(VI) bioreduction at the Hanford 100H Site, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H44C-03.
- Hoversten, M., E. Gasperikova, J. Chen, and G. Newman (2005), Joint inversion of marine seismic and CSEM data for fluid saturation prediction, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract GP41B-0882.
- Hou, Z., J. Chen, and Y. Rubin (2005), On application of ground-penetrating radar tomography in shallow subsurface hydrological parameter estimation, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H43J-01.
- Hubbard, S., J. Chen, K. Williams, J. Peterson, and Y. Rubin (2005), Environmental and agricultural applications of GPR, *International Workshop on Ground Penetrating Radar Invited Keynote*, Delft, Netherlands, May 2-4.
- Chen, J., S. Hubbard, M. Fienen, T. Mehlhorn, and D. Watson (2003), Estimating hydrogeological using high-resolution geophysical data and Markov chain Monte Carlo methods, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract H21F-04.
- Rubin, Y., J. Chen, Z. Hou, M. Kowalsky, and S. Hubbard (2003), Bayes, Zadeh, and Shannon, and the development of a structured approach to the hydrogeological data fusion problem, *EGS-AGU-EUG Joint Invited Assembly*, Nice, France, *Geophysical Research Abstract 5*, 02403.
- Chen, J., S. Hubbard, Y. Rubin, C. Murray, E. Roden, and E. Majer (2002), Geochemical characterization using geophysical data and Markov chain Monte Carlo methods, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., Abstract H52F-10.
- Rubin, Y., J. Chen, S. Hubbard, M. Kowalsky, and A. Woodbury (2002), A structured approach to Bayesian data fusion, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., Abstract H52F-05, Invited.
- Hubbard, S., K. Williams, J. Chen, Y. Rubin, and E. Majer (2001), Characterization and monitoring of the Oyster Bacterial Transport Site using geophysical data, *GSA Abstracts*, Boston, Nov. 1-10.
- Hubbard, S., J. Chen, B. Mailloux, E. Majer, and Y. Rubin (2000), Heterogeneity and bacterial transport at the Oyster, VA Site, *Eos Trans. AGU*, 81(48), Fall Meet. Suppl., Abstract B51C-01.
- Swift, D., M. Green, J. Chen, S. Hubbard, E. Majer, and M. Christopher (2000), Deriving hydrofacies from lithofacies at the Oyster Virginia experimental site, *Eos Trans. AGU*, 81(48), Fall Meet. Suppl., Abstract B52A-04.

Christopher, M., E. Roden, K. Overstreet, Y. Chien, J. Chen, and S. Hubbard (2000), Spatial heterogeneity of microbial iron reduction potential at the South Oyster Focus Area, Virginia, *Eos Trans. AGU*, 81(48), Fall Meet. Suppl., Abstract B51C-11.

Chen, J., S. Hubbard, and Y. Rubin (1999), Estimating hydraulic conductivity at the Oyster (VA) Site from hydrological and geophysical data by using Bayesian methods based on a normal linear model, *Eos Trans. AGU*, 80(48), Fall Meet. Suppl., Abstract GP31B-10.

Green, M, D. Swift, J. Chen, S. Hubbard, E. Majer, and C. Murray (1999), Heterogeneity at the Narrow Channel Site, Oyster, VA: a statistical approach to assess the sedimentary facies prior to correlations with permeability and geophysical imaging, *EOS*, Washington D.C.